DOCUMENT RESUME

ED 045 523 SO 000 431

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TITLE High School Geography Project. Introductory Unit. ETS Evaluation Report, Limited Field Trials.
INSTITUTION Educational Testing Service, Princeton, N.J.
SPONS AGENCY Association of American Geographers, Washington, D.C.; National Science Foundation, Washington, D.C.
PUB DATE 15 Apr 66
NOTE 25p.

EDRS PRICE EDRS Price MF-$0.25 HC-$1.35
DESCRIPTORS Activity Units, Concept Teaching, *Curriculum Development, *Curriculum Evaluation, *Environmental Education, *Field Studies, Fundamental Concepts, *Geography, Grade 10, Inductive Methods, Learning Activities, Secondary Grades, Social Studies Units
IDENTIFIERS *High School Geography Project, HSGP

ABSTRACT

This unit is one of several being prepared as a part of a geography course based on a settlement theme provisionally planned for tenth grade students. The materials are part of a larger proto unit on "A Structure of Geography." The original unit was tried out during the spring of 1965, then revised for the limited school trials. The regional trials were conducted in conjunction with the Intra-Urban and Fresh Water Units during the fall of 1965 in four areas; California, Illinois, Ohio and New Jersey with a total of 47 teachers and approximately 2200 students participating. Teachers administered the School and College Ability Tests (SCAT) form 2A, and the Introductory and Intra-Urban unit tests as pre- and post-tests. Significant impressions of the unit were recorded on questionnaires by teachers, students, and observers. In conclusion, the response was positive, and the materials seemed appropriate for high school students. Suggestions for improvement include: revision of the text to make it more readable, and revision of the guide to provide more background teacher material and suggestions for supplementary readings and activities for students of varied ability. See SO 000 443 for a list of the related reports. (SBE)

ED045523

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HIGH SCHOOL GEOGRAPHY PROJECT

INTRODUCTORY UNIT

ETS Evaluation Report

Limited Field Trials

April 15, 1966

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SP 000 431

Educational Testing Service

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INTRODUCTORY UNIT

I. Description of the Evaluation

This report is prepared to serve two purposes. Of primary importance is the need to provide the unit author and others responsible for the unit's revision with explicit suggestions, where needed, for modifying the unit. These suggestions are based upon test results and data from questionnaires filled out by the teachers, students, and observers who were involved in the tryout of the unit materials. At the same time general impressions of the unit's present effectiveness are needed to help in making decisions affecting the development of other units. It is hoped that these impressions may be of some help in formulating materials and strategies which are even more effective in accomplishing desirable educational objectives.

Because the conditions under which curriculum materials are tried out is critical in their evaluation, in this section we will describe the circumstances of the tryout, as well as some of the characteristics of the teachers and students who participated. Section II of the report will discuss the impressions of the participating teachers, students, and observers. Section III will enumerate specific suggestions for modifying the unit. Supporting data for most of the generalizations in the report will be provided in the appendices of Section IV.

The Introductory Unit is one of several units being prepared by the High School Geography Project as a part of a geography course provisionally planned for tenth-grade students. The unit is designed to introduce a limited conceptual framework for a course based on a settlement theme. The materials of this unit are part of a larger protounit on "A Structure of Geography," prepared under the direction of Dr. Edwin N. Thomas of Arizona State University.

The present version of the Introductory Unit was taught by most teachers in six class periods or approximately one week of school time. The unit contains six elements, or parts, which together are designed to teach the student two fundamental concepts in the structure of geography: geographic fact and spatial distribution. The first two activities are concerned with an analysis of a conceptual structure of geography and the significance of geographic facts. The teaching procedure used is informal lecture and discussion. Five diagrams are included in a student text to assist in the presentation of the topics. Activities three and four engage the student in specific exercises which parallel and further reinforce earlier learnings. Some are related to the reading and plotting of locations and others to the recognition and development of geographic facts. Activity five consists of a discussion and analysis of spatial distributions, supplemented by a diagram of hypothetical distributions. The concluding activity involves the student in two exercises which further reinforce the learnings of the preceding activity. These require the student to recognize and develop the distributive elements of pattern, density, and dispersion.

A teacher's guide parallels a student text for each of the six activities. The guide contains the student learning objectives and teaching suggestions for each activity. Two of the three discussion activities are supplemented by a section entitled "Material in Depth." A brief introduction and summary of the six activities is also included. The student text contains all of the unit's charts, diagrams, and tables. Instructions for the various exercises are detailed in the text and each is preceded by a student "goal." Diagrams are explained in the text and examples of correct answers are provided for each standardized exercise. The teacher's guide and student text are designed to coordinate the various activities into a meaningful and integrated whole for the purpose of teaching the two major geographic concepts of the unit.

The original protounit was tried out during the spring of 1965 at the Washington High School in Tempe, Arizona. On the basis of student and teacher reaction to those informal trials, the unit was revised so that part of its content could be presented in the limited school trials. The limited (regional) field trials of the Introductory Unit were conducted in conjunction with the Intra-Urban and Fresh Water Units during the fall of 1965. Four areas of the nation: California, Illinois, Ohio, and New Jersey, were chosen as tryout centers. Each of the four areas was organized under the leadership of an Area Coordinator who supervised the teachers in the area and was responsible for the transfer of materials between the Educational Testing Service, the High School Geography Project, and the teachers. A total of 47 teachers and approximately 2200 students participated in these trials.

In October 1965, the participating teachers administered the School and College Ability Tests (SCAT), form 2A, which is designed for senior high school students. They also administered the Introductory and Intra-Urban unit tests as pretests. One to two weeks was devoted to the Introductory unit materials. This was followed by the Intra-Urban unit for four or five weeks, after which the two unit tests were readministered.

Students and teachers filled out unit evaluation forms at the end of the unit. Teachers also filled out evaluation forms as they progressed through the unit. Six of the teachers were observed every day the unit was taught. Then observers filled out evaluation forms similar to the activity forms of the teachers.

The 47 teachers who participated in the tryout of this unit were recruited by the Area Coordinators and paid an honorarium for their participation. Thirteen of the teachers were from the area of San Diego, California, 10 from central Illinois, 12 from Ohio, and 12 from New Jersey. As a group they seem to be better prepared than most high school social studies teachers. They are also probably more experienced than most high school teachers.

The 46 teachers who completed a background information questionnaire indicated a greater amount of course work in history than in geography, the mean number of semester hours being 20 and 15 respectively. The mean for "other social science" was 19 semester hours, which suggests that this a well-prepared group of social studies teachers. Only about 20% had any geology course work and for these only one or two courses were indicated.

More than half of the teachers (54%) have 6 or more years teaching experience while 20% have less than four years. However, experience in teaching geography is somewhat less, with 30% having 6 or more years and 43% having less than 4 years.

The total number of students in the trials was just short of 2200. Twelve hundred thirty-one of these were boys and 963 were girls. More students were in the 9th grade (885) than in any other grade. (618 in 10th, 140 in 11th, and 385 in 12th) This 9th-grade emphasis in the tryout group is due largely to the use of California students, where all were 9th graders.

Most of the participating students came from large schools. It is likely that about 20% of the students were in schools enrolling fewer than 200 in 10th grade, whereas more than 40% had at least 400 in their 10th-grade class. Only 380 of the students were from rural or small town areas, while 657 lived in towns of 20,000-100,000, 512 were in predominantly suburban areas and 585 were from cities of over 100,000.

Performance of the student group on the Cooperative School and College Ability Test (SCAT) indicates that they were above average in verbal ability, their mean score being equivalent to a position at the 60th percentile for 10th-grade SCAT norms. Mathematical ability scores are at the 50th percentile rank for 10th grade. A 20% random sample of student questionnaires was drawn for analysis. This sub-sample showed approximately the same SCAT results as the total group.

II. Teacher, Student, and Observer Impressions

This section of the report is designed to reflect significant, global impressions of the unit as recorded on questionnaires by teachers, students, and observers. Student impressions are based on a 20% student sample (301 students) from three of the four geographic areas. Two subgroups, those who scored in the upper and lower quartiles, have been isolated for comparison with the total 20% student sample. Teacher and observer impressions are based on reactions from the participants in all four areas.

A. The Unit As A Whole

Teachers found the unit to be effective in the important areas of conceptual development, appropriateness of subject matter, and unit materials (other than reading materials). Observers reported that teachers tended to use the materials effectively. Many teachers believed that the unit presented the structure of geography in a completely new and challenging way. Virtually all the teachers considered their knowledge of geography adequate for teaching about geographic facts, whereas only 75% felt comfortable with the materials on spatial distributions.

A recurrent problem, encountered by most teachers, concerned the unit's excessive use of difficult words and technical terms (especially spatial distributions). Related to this problem was the impression of some teachers that the unit materials were too abstract and removed from the real world of student experience.

Most of the teachers found the subject matter appropriate for this age-group. About 65% of the teachers thought the manner in which concepts were developed was generally good or excellent. Almost 80% of the teachers agreed that the number of concepts was about right, while 95% considered the sequence of concepts good or excellent. Several teachers, however, commented that the unit needed more illustrations and examples to clarify the concepts.

Three-fourths of the student sample found the unit as a whole to be either generally or extremely interesting. The high quartile and low quartile groups in terms of SCAT responded in the same fashion as the total group. This overall impression is reflected by almost 90% of the teachers who found the degree of student interest in unit materials to be generally good or excellent. They tended to underestimate the degree of interest of the materials for low ability students however. Only about 40% of the teachers rated the materials of positive interest to low ability students, whereas 74% of the lower quartile students stated a positive interest in the materials.

B. Reading Materials

A large group of students, 45% of the sample group, found the unit's reading materials generally uninteresting and dull. This impression was more pronounced, contrary to expectations, among the high quartile group. Student suggestions for improving the unit invariably focused on the need to improve reading materials. Students would like the readings to be more interesting, to use simpler words and definitions, and to provide more explanations and examples of the ideas to be learned.

Student impressions were strongly substantiated by the teachers. Fifty-six per cent did not believe the reading materials were clearly written and understandable for the majority of students. In support of this position, teachers commented that the vocabulary was too difficult and too technical for most students, especially slow learners, and that reading materials generally lacked sufficient explanations and examples. Observers indicated a greater need to involve the student in unit materials by providing more examples from the students' own experience.

C. Unit Activities

The unit activities, which tended to be either lectures, discussions, or desk exercises for students, were described as interesting by most students. Eighty-two per cent of the student sample found them generally or extremely interesting, while only 18% indicated they were uninteresting and dull. The high and low quartile groups generally reflected the impressions of the larger student sample. More than three-fourths of the teachers believed that all the exercises were effective in stimulating student interest. This impression is supported by the 6 observers who indicated high levels of student interest in almost all the exercises. Observers also found that most exercises were able to sustain student interest for either all or more than half of a class period.

Sixty-three per cent of the teachers observed that the activities were appropriate in meeting individual student needs. However, more than 90% indicated that they were effective in helping students learn what was intended. This impression is substantiated by most observers who indicated that all activities appeared to accomplish their objectives. At least 70% of the teachers believed all activities should be retained with either no revision or with minor revisions. Although 58% of the teachers thought the number of student exercises appropriate for the unit, 37% stated the number was too few.

Student reaction to the type of unit activity was mixed. Seventy-three per cent of the students found class discussions generally or extremely interesting, whereas 82% expressed similar degrees of interest in the student activities (exercises). A student exercise, plotting and reading locations, was selected as the most interesting by 58% of the students. The popularity of this exercise is confirmed by the 81% who considered it either extremely or generally interesting. However, the other two desk type activities received considerably fewer affirmative responses by students. The high and low quartile groups similarly reflected the mixed impressions of the larger group concerning the type of unit activity preferred.

Teacher judgments of the exercise which was most effective in meeting the objectives of the unit agreed with student impressions of interest in the plotting and reading locations exercise. However, teachers reversed the impressions of students by favoring the facts of geographic significance exercise over the exercise on the elements of spatial distribution. Teachers

consistently indicated the need for more illustrations and examples for activities. Many noted that desk type activities should follow closely discussions of the subject matter from which these activities grow. This does not occur, they observed, in activity two and three.

D. Teachers Guide

Most teachers thought that the guide was either generally or very helpful in clarifying the objectives of the unit, and to a lesser extent in suggesting a variety of learning activities. A majority of teachers, however, stated the guide was inadequate in providing needed geographical background for teachers, including suggested reference books, and in suggesting supplementary reading materials for students. Teachers were in some disagreement on the guide's effectiveness in providing for continuous evaluation of student progress. Forty-six per cent of the teachers indicated that guidelines for this purpose were inadequate. A significantly larger group, 68% of teachers, stated the guide was inadequate in providing for flexibility in meeting individual learning needs. Most teachers, however, believed the directions supplied in the guide were adequate. Many teachers commented on the need to more effectively coordinate the guide with the student text.

E. Tests

Three-fourths of those responding to a question on the unit test felt that it adequately measured the learning objectives of the unit. The teachers who commented negatively observed that the vocabulary was too difficult for the average student and that the test needed better directions.

III. Suggestions for Modifying the Unit

The response of both teachers and students to the unit is encouraging. As might be expected, the percentage of teachers having a positive response is somewhat less than that indicated for the more elaborate Intra-Urban unit. However, student interest is at the same high level for both units. Thus, there seems to be little question about whether this sort of material can be made suitable for high school students. The major improvement suggested for the unit is a revision in the text to make it more readable. A second suggestion is revision of the teacher's guide to provide more background material for teachers and suggestions for supplementary readings and activities for students of varied abilities.

The remaining suggestions for unit revision are directed at specific aspects of individual activities. Each activity is first described as the unit author intended it to be used in the classroom. General observations of those teachers who taught and evaluated the activity are indicated with respect to the following:

a) Whether the activity was generally effective or ineffective in stimulating student interest. Where student opinions are available, these are included as well.

b) Whether the activity was generally effective or ineffective in helping students learn what was intended.

c) Whether the activity should be retained in the unit without revision, with minor revisions, with major revisions, or whether it should not be retained.

The effectiveness of the activity in helping students learn what was intended is then analyzed with respect to the results of those questions which test the students' understanding of the concept(s) to be taught by the activity. Finally, suggestions for improving the activity are listed. The number of teachers mentioning each idea is indicated in parentheses.

Activity 1: Discussion of an Overview of the Structure of Geography

Activity 1 is designed to make the student aware of a conceptual structure of geography based upon the interrelationship of five basic concepts. The teaching procedure involves a teacher-led discussion with the aid of a diagram.

Three-fourths of the teachers found the activity to be effective in stimulating student interest. Seventy-one per cent indicated the activity was also effective in helping students learn what was intended. And almost 70% felt that the activity should be retained as it is or with minor revisions, some of which are suggested below. It should be noted, however, that all the other activities received a higher percentage of favorable responses than this one.

Question 79 is directly related to this activity. The slight 5% increase from the pretest, 56%, to the posttest, 61%, may be related to the difficulty, experienced by many teachers, in understanding the basic geographic concepts.

Teachers made the following comments and suggestions for modifying the activity:

1. The general vocabulary is too difficult and should be simplified; conceptual terminology needs further clarification--glossary requested. (17)

2. The relationships among the five basic concepts should be further clarified; figure 1 is confusing. (4)

3. More illustrations and examples of each concept should be included in this activity. (4)

Activity 2: Discussion of Geographic Facts

Activity 2 is the first of three activities which deal with the concept of geographic facts. In this activity, the student learns to identify the component parts of a geographic fact and to distinguish these facts from other statements. The teaching procedure is informal lecture-discussion and involves the use of a world map and three diagrams. A section called Material in Depth is included in the teacher's guide to provide additional background for the discussion of geographic facts.

Almost all teachers found the activity to be effective in stimulating student interest and in helping students learn what was intended. Eighty-seven per cent indicated that the activity should be retained as it is or with minor revisions, some of which are suggested below. The students themselves were somewhat less enthusiastic, some 63% finding the activity interesting.

Question	Pretest	Posttest	Increase
82	5%	20%	15%
83	57	71	14
86	53	53	0
88	62	67	5
89	36	49	13
90	57	69	12
92	19	48	29
94	85	72	-13
98	35	67	32
	M45%	M57%	M12%

The preceding questions are directly related to this activity. They also reflect, to a lesser degree, the effectiveness of the next two activities. The mean increase from pretest to posttest for these items is 12% (45% - 57%), 2% below the mean increase for all questions. The questions in this group which showed the smallest per cent increase (5 to 13) were items related to the general understanding of geographic facts. They also used some of the more difficult terms, such as phenomenon, nominal, qualitative, and quantitative. Question No. 94 dropped from 85% right in the pretest to 72% right in the posttest. In the posttest, students apparently confused a distractor (Cartesian) with the key (latitude-longitude) since these sub-concepts were developed at the same time.

Teachers made the following comments and suggestions for modifying the activity:

1. The general vocabulary and specialized terminology should be simplified, especially such words as phenomenolcgical, temporal, and locative. (9)

2. Activities three and four are really part of this activity and these exercises should follow the discussion of the Cartesian and polar coordinate systems and geographic facts. (2)

3. Exercises should accompany the discussions on the nominal and locative elements of geographic facts.

Activity 3: Plotting and Reading Locations

In Activity 3, students are given two exercises in reading locations in the Cartesian and polar coordinate systems. They also are given two exercises in plotting locations in the two coordinate systems. The background material for these desk exercises is introduced and discussed in the previous activity.

Almost all teachers found the activity to be effective in stimulating student interest and in helping students learn what was intended. Eighty-seven per cent indicated that the activity should be retained in the unit. Of this group, 57% want it retained without revision while 30% believe it needs minor revisions. Students selected this as by far the most interesting of all the activities in the unit. Many students stated it was most interesting because the exercises dealt with concrete facts which could be applied to solve problems.

Test questions 81 and 95 specifically relate to this activity. The mean increase from pretest to posttest for these items is 12% (33% - 45%), 2% lower than the mean increase for all the questions in the test. Question 95, with only a 6% increase from pretest to posttest, is related to an understanding of the polar coordinate system as it applies to direction.

Question	Pretest	Posttest	Increase
81	41%	58%	17%
95	25	31	6
	M33%	M45%	M12%

Teachers made the following comments and suggestions for modifying the activity:

1. The Cartesian and polar coordinate systems should be further clarified in the student text. (6)

2. In the plotting and reading exercises, the locations should refer to real places instead of unknown points in space. (2)

3. The plotting and reading exercises are too easy for the better students. (2)

Activity 4: Facts of Geographic Significance

This activity is designed to develop the skill required to recognize what kind of factual information is or is not useful to geographers. In two separate desk exercises, which may be assigned for homework, students are asked to both identify geographic facts and to develop them. Two tables are included to assist the student in these exercises. The background material for these exercises is introduced and discussed in Activity 2.

Most teachers found the activity to be effective in stimulating student interest and in helping students learn what was intended. Ninety-two per cent indicated the activity should be retained without revision or with minor revisions. Only 57% of the students indicated that this activity was either generally or extremely interesting. However, 74% of the more verbal students expressed positive interest in the exercise.

Test question No. 80 specifically related to this activity. The increase from 60% pretest to 70% posttest for this item is 10%, 4% below the mean increase for both tests. All of the options in this question refer to places except the key option, which may have attracted students to it in the pretest and posttest.

Teachers made the following comments and suggestions for modifying the unit:

1. The specialized vocabulary of this activity is too difficult for most students and should be simplified; this is true for words such as qualitative, quantitative, locative, phenomenological, and relative. (11)

2. Part 2 of this activity, developing geographic facts, is too confusing for slow students and too time consuming for everyone. It should be eliminated. (9)

3. This activity should logically follow the material at the end of the second activity which explains geographic facts. (1)

Activity 5: Discussion of Spatial Distributions

In Activity 5, the student learns the basic idea of a spatial distribution and the three basic elements of discrete distributions. A diagram of hypothetical distributions is included to assist the student in this teacher-led discussion activity. A section called Material in Depth is included in the teacher's guide to provide additional background for the classroom discussion.

Most teachers found the activity effective in stimulating student interest and in helping students learn what was intended. Eighty-one per cent stated that the activity should be retained. Sixty-three per cent of this group indicated that it should be retained with minor revisions. Students found this activity to be the least interesting part of the unit because the discussions confused them and they were unable to understand the subject matter.

Test questions No. 91 and 97 are directly related to this activity. The mean increase from pretest to posttest for these two items is 14%, the same as the mean increase for all questions in the test.

Question	Pretest	Posttest	Increase
91	36%	55%	19%
97	52	61	9
	M44%	M58%	M14%

Teachers made the following comeents and suggestions for modifying the activity:

1. The activity's specialized vocabulary should be simplified. (6)

2. The concept of dispersion is too difficult for most students and should be further clarified. (11)

3. The relationship between pattern, density, and dispersion is not clear; more concrete illustrations are needed to explain these concepts. (8)

4. More visual aids and examples are needed to assist the teacher in presenting this material.

Activity 6: The Elements of Spatial Distributions

Activity 6 is a continuation of the basic features of spatial distributions, introduced in the previous activity. In the first exercise, students are asked to identify pattern, density, and dispersion and to discriminate among them. A group of 12 hypothetical distributions and a table used to note differences is included. In the second exercise, students are given 12 hypothetical study areas and are asked to develop four sets of spatial distributions which vary in pattern, density, and dispersion.

Ninety-four per cent of the teachers found the activity to be effective in stimulating student interest. Seventy-seven per cent of the teachers noted that the activity was effective in helping students learn what was intended and that it should be retained without revision or with minor revisions. Twenty-one per cent, however, indicated the activity should be retained but with major revisions. For the students, this activity rated second only to the exercise on plotting and reading locations.

The test questions which follow directly relate to this activity. The mean increase from pretest to posttest for these items is 21%, 7% above the mean increase for both tests. This represents the highest per cent increase from pretest to posttest of all of the activities in the unit.

Question	Pretest	Posttest	Increase
84	30%	57%	27%
85	19	22	3
87	21	53	32
93	33	62	29
96	46	62	16
	M30%	M51%	M21%

Teachers made the following comments and suggestions for modifying the activity:

1. More examples of pattern, density, and dispersion should be given before these exercises are presented. (15)

2. Part 2 of the activity is confusing; the grading process is too time consuming; it should be eliminated. (8)

3. Illustrations and examples should be related to real life situations, in order to motivate interest and learning. (6)

APPENDIX A

TEACHER EVALUATIONS OF THE INTRODUCTORY UNIT*

	Very positive response	Positive response	Negative response	Very negative response
Reading Materials				
1. Do you believe the reading materials are clearly written and understandable for the majority of the students?**	-	44%	56%	-
2. Do you believe the reading materials are well-organized from an instructor's point of view?	-	81	19	-
3. How would you rate the author's use of questions in terms of stimulating student thought and furthering learning?	10	64	18	8
The Concepts Developed in the Unit				
4. How appropriate is the number of concepts in the unit?	-	78	12	10
5. How would you rate the sequence of the concepts?	33	62	5	0
6. How would you rate the manner in which the concepts are developed (i.e., the kind and amount of explanation)?	10	54	29	7
Teacher's Guide				
How helpful was the teacher's guide in regard to each of the following aspects of teacher preparation and instruction?				
7. Clarifying the objectives of the unit	44	37	16	3
8. Suggesting a variety of learning activities	7	58	33	2
9. Providing needed geographical background, including suggested reference books	10	29	44	17
10. Suggesting supplementary reading materials for students	3	12	39	46
11. Providing guidelines for continuous evaluation of student progress	7	47	30	10
12. Providing for flexibility in meeting individual learning needs	2	30	47	21

* Evaluations of the unit are based on responses of 44 teachers to questions in the Teacher Unit Evaluation Form. The percentages indicate the proportion of the 44 teachers who responded to each question in one of the specified ways.

** When 2 responses are indicated they are "yes" or "no"; when 3 responses are indicated, they are "about right," "too few," or "too many"; when 4 responses are indicated, they range from excellent or very helpful to very poor, definitely inadequate, or definitely inappropriate.

Student Activities

		Very positive response	Positive response	Negative response	Very negative response
13.	How would you evaluate the appropriateness of the activities in terms of their adaptability to students with different levels of ability?	21%	42%	30%	7%
14.	How appropriate is the number of activities suggested?	-	58	37	5

15. Name the student exercise which was most effective in meeting the objectives of the unit.

Plotting and Reading Locations - 41%
Facts of Geographic Significance - 38%
Elements of Spatial Distribution - 10%
Discussion of Spatial Distributions - 8%
Discussion of Geographic Facts - 3%

16. Name the student exercise which was least effective in meeting the objectives of the unit.

Elements of Spatial Distribution - 31%
Overview (Activity 1) - 19%
Plotting and Reading Locations - 17%
Facts of Geographic Significance - 14%
Discussion of Spatial Distributions - 8%
None - 8%
Discussion of Geographic Facts - 3%

Unit Materials

How would you evaluate the unit materials other than reading materials? (For example: maps, films, pictures, special teaching devices)

17.	Degree of interest for students in general	25	63	9	3
18.	Degree of interest for high ability students	36	49	12	3
19.	Degree of interest for low ability students	3	36	49	12
20.	How would you rate the unit materials in terms of their variety?	15	67	15	3
21.	Do you feel the unit test adequately measured the learning objectives of the unit?	-	75	25	-

APPENDIX B

TEACHER EVALUATIONS OF THE INTRODUCTORY UNIT ACTIVITIES

CHART I*

Activity	Effectiveness in Stimulating Student Interest				Effectiveness in Helping Students Learn What Was Intended				Opinion on Whether Activity Should be Retained in Unit				Number of Teachers Reporting
	Very Effective	Generally Effective	Generally Ineffective	Definitely Ineffective	Very Effective	Generally Effective	Generally Ineffective	Definitely Ineffective	Yes, Without Revision	Yes, With Minor Revision	Yes, With Major Revision	No	
1	3%	72%	20%	5%	5%	66%	29%	0%	18%	51%	28%	3%	40
2	30	62	8	0	30	60	8	2	46	41	10	3	40
3	44	51	5	0	54	42	2	2	57	30	10	3	41
4	20	65	15	0	28	62	10	0	39	53	5	3	40
5	31	55	11	3	22	65	8	5	18	63	16	3	38
6	63	31	3	3	20	57	20	3	24	52	21	3	36

CHART II

Activity #	Minutes Spent on Activity by Most Teachers	% Suggesting More Time for the Activity	% Thinking Subject Matter Appropriate for Students	% Thinking Their Knowledge of Geography Adequate to Teach Activity	% Thinking Teacher's Guide Directions Adequate	% Thinking Materials and Student Directions Adequate
1	more than 45	24%	72%	82%	61%	61%
2	more than 45	28	90	95	92	94
3	30-45	20	93	95	93	85
4	more than 45	27	95	97	85	82
5	more than 45	34	87	76	71	63
6	30-45	24	89	73	78	66

* Charts I and II of Appendix B are based on teacher responses to questions in the Teacher Activity Evaluation Form. The percentages indicate the proportion of teachers who responded to each question in one of the specified ways. The teachers who omitted the activity or the specific question are not included.

APPENDIX C

STUDENT EVALUATIONS OF THE INTRODUCTORY UNIT ACTIVITIES (CHART I)*

Activity	Extremely Interesting			Generally Interesting			Generally Uninteresting			Dull		
	Total	High	Low	Total	High	Low	Total	High	Low	Total	High	Low
Unit as a Whole	10%	14%	12%	65%	61%	62%	17%	21%	13%	8%	4%	13%
Reading Materials	4	3	8	51	50	48	30	36	28	15	11	16
Student Activities	29	30	30	53	50	47	14	18	15	4	2	8
The Map Used	31	36	33	49	43	53	13	17	5	7	4	9
Class Discussions	21	28	24	52	49	52	14	14	10	13	9	14
Geographic Facts	15	15	24	48	52	47	20	20	14	17	13	15
Exercise on Plotting and Reading Locations	45	38	42	36	40	33	13	12	17	6	10	8
Exercise on Facts of Geographic Significance	8	11	11	49	63	46	29	21	27	14	5	16
Spatial Distribution	18	18	23	42	45	44	26	25	15	14	12	18
Exercise on Elements of Spatial Distribution	26	32	28	38	29	40	21	24	19	15	15	13

* Student evaluations are based on responses of the 20 per cent student sample. Students were to indicate their degree of interest on a Student Evaluation Form. The Total columns list the percentages of the 328 sample students from California, Ohio, and New Jersey who responded in the indicated way. The High and Low columns list the responses of those sample students scoring in the High and Low quartiles on SCAT, 80 and 87 students respectively.

STUDENT EVALUATIONS OF THE INTRODUCTORY UNIT ACTIVITIES (CHART II)*

Activity	% of Students Who Found Activity MOST Interesting	% of Students Who Found Activity LEAST Interesting
Geographic Facts	9%	25%
Exercise on Plotting and Reading Locations	58	11
Exercise on Facts of Geographic Significance	5	25
Spatial Distribution	16	27
Exercise on Elements of Spatial Distribution	12	11

* Student evaluations are based on responses of the 20 per cent student sample. Students were asked to choose the activity which they found the Most interesting and the one which they found the Least interesting on the Student Unit Evaluation Form.

271 students from the 328 in the sample selected a most interesting activity; 246 selected a least interesting activity.

APPENDIX D

PRETEST-POSTTEST RESULTS COMPARED*

	Pretest	Posttest	Increase
Mean Score	8.33	11.31	2.98
Standard deviation	2.95	3.64	.69

79.

	0	A	B	C	D
0	2	1	5	0	12
A	5	55	34	8	55
B	5	32	75	15	77
C	8	40	35	47	114
D	14	94	134	104	651

Posttest \ Pretest	0	R	W	
0	2	12	6	
R	14	651	332	997 or 61%
W	18	246	341	
		909 or 56%		

80.

	0	A	B	C	D
0	1	0	13	4	4
A	1	11	43	11	30
B	20	68	740	112	201
C	4	14	74	20	34
D	5	20	98	27	67

Posttest \ Pretest	0	R	W	
0	1	13	8	
R	20	740	381	1141 or 70%
W	10	215	234	
		968 or 60%		

81.

	0	A	B	C	D
0	1	9	3	4	3
A	18	151	37	124	100
B	3	15	21	29	17
C	10	28	24	44	38
D	20	211	63	142	507

Posttest \ Pretest	0	R	W	
0	1	3	16	
R	20	507	416	943 or 58%
W	31	155	473	
		665 or 41%		

82.

	0	A	B	C	D
0	1	1	1	15	0
A	3	22	9	273	12
B	1	7	6	17	3
C	28	40	30	1012	42
D	0	8	8	69	14

Posttest \ Pretest	0	R	W	
0	1	1	16	
R	3	22	294	319 or 20%
W	29	55	1201	
		78 or 5%		

*These results are based on the group of 1622 students who took both the pretest and posttest. Read down for the pretest results and across for the posttest results. The keyed option is underlined. "0" indicates the number of students who omitted the question.

83.

	0	A	B	C	D
0	2	1	2	14	3
A	4	23	23	36	21
B	8	29	44	63	20
C	29	87	145	720	166
D	6	14	21	87	54

Posttest	0	Pretest R	Pretest W	
0	2	14	6	
R	29	720	398	1147 or 71%
W	18	186	249	
		920 or 57%		

84.

	0	A	B	C	D
0	1	3	5	3	8
A	1	44	29	15	32
B	10	117	167	51	110
C	2	25	30	20	26
D	23	183	346	67	304

Posttest	0	Pretest R	Pretest W	
0	1	8	11	
R	23	304	596	923 or 57%
W	13	168	498	
		480 or 30%		

85.

	0	A	B	C	D
0	5	10	6	3	6
A	9	74	139	76	66
B	25	125	270	108	156
C	9	46	89	57	69
D	7	50	82	43	92

Posttest	0	Pretest R	Pretest W	
0	5	10	15	
R	9	74	281	364 or 22%
W	41	221	966	
		305 or 19%		

86.

	0	A	B	C	D
0	1	0	10	7	1
A	0	3	19	23	10
B	14	16	578	218	31
C	17	9	229	324	30
D	2	7	24	29	20

Posttest	0	Pretest R	Pretest W	
0	1	10	8	
R	14	578	265	857 or 53%
W	19	272	455	
		860 or 53%		

87.

	0	A	B	C	D
0	1	7	7	3	4
A	3	33	22	24	30
B	11	133	205	177	340
C	8	42	38	56	51
D	13	71	79	97	167

Posttest	0	Pretest R	Pretest W	
0	1	7	14	
R	11	205	650	866 or 53%
W	24	139	571	
		341 or 21%		

88.

	0	A	B	C	D
0	3	0	3	2	13
A	1	17	16	16	28
B	7	17	81	46	112
C	4	11	23	43	64
D	26	54	129	124	782

			Pretest R	Pretest W	
	0	3	13	5	
Posttest	R	26	782	307	1115 or 67%
	W	12	204	270	
			999 or 6[illegible]%		

89.

	0	A	B	C	D
0	2	5	4	8	2
A	20	386	82	265	33
B	6	57	49	98	11
C	12	131	67	323	31
D	0	8	3	14	5

			Pretest R	Pretest W	
	0	2	5	14	
Posttest	R	20	386	380	786 or 49%
	W	18	196	601	
			587 or [illegible]%		

90.

	0	A	B	C	D
0	1	4	1	16	3
A	6	17	18	24	24
B	6	11	28	49	29
C	33	111	140	794	204
D	5	16	20	35	27

			Pretest R	Pretest W	
	0	1	16	8	
Posttest	R	33	794	455	1282 or 55%
	W	17	108	190	
			590 or 5[illegible]%		

91.

	0	A	B	C	D
0	2	4	6	8	5
A	10	62	56	37	55
B	17	149	393	125	209
C	9	51	71	56	73
D	5	43	64	36	76

			Pretest R	Pretest W	
	0	2	6	17	
Posttest	R	17	393	483	893 or 55%
	W	24	191	489	
			590 or [illegible]%		

92.

	0	A	B	C	D
0	4	5	1	3	11
A	3	46	19	26	21
B	4	42	34	32	35
C	14	250	70	193	251
D	16	144	42	118	238

			Pretest R	Pretest W	
	0	4	3	17	
Posttest	R	14	193	571	778 or 48%
	W	23	176	621	
			372 or [illegible]%		

93.

	0	A	B	C	D
0	4	2	9	7	4
A	2	23	17	21	14
B	8	66	141	86	31
C	21	136	385	372	94
D	7	29	72	41	30

Posttest	0	Pretest R	Pretest W	
0	4	7	15	
R	21	372	615	1008 or 62%
W	17	148	423	
		527 or 33%		

94.

	0	A	B	C	D
0	5	24	0	1	1
A	26	1039	34	54	21
B	4	60	16	8	4
C	7	231	14	25	10
D	2	26	4	4	2

Posttest	0	Pretest R	Pretest W	
0	5	24	2	
R	26	1039	109	1174 or 72%
W	13	31[illegible]	87	
		1380 or 85%		

95.

	0	A	B	C	D
0	6	4	10	10	5
A	9	86	68	130	38
B	14	74	175	195	42
C	30	112	130	323	66
D	2	18	21	29	25

Posttest	0	Pretest R	Pretest W	
0	6	10	19	
R	14	175	311	500 or 31%
W	41	219	827	
		404 or 25%		

96.

	0	A	B	C	D
0	5	3	4	15	7
A	10	52	33	66	39
B	5	42	31	69	44
C	17	144	132	534	181
D	9	32	34	63	51

Posttest	0	Pretest R	Pretest W	
0	5	15	14	1008 or 62%
R	17	534	457	
W	24	198	358	
		747 or 46%		

97.

	0	A	B	C	D
0	8	7	1	23	1
A	9	47	41	99	27
B	15	56	73	107	25
C	27	138	177	570	75
D	0	16	25	40	15

Posttest	0	Pretest R	Pretest W	
0	8	23	9	
R	27	570	390	987 or 61%
W	24	246	325	
		839 or 52%		

98.

	0	A	B	C	D
0	8	12	7	6	8
A	39	443	165	186	252
B	4	19	25	15	20
C	18	76	47	70	83
D	7	23	12	19	58

			Pretest R	Pretest W	
	0	8	12	21	
Posttest	R	39	443	603	1085 or 67%
	W	29	118	349	
			573 or 35%		

0755

FORM NHS2

INTRODUCTION TO GEOGRAPHY

Time—15 minutes

YOU ARE TO INDICATE ALL YOUR ANSWERS ON THE SEPARATE ANSWER SHEET. No credit will be given for anything written in the test book. After you have decided which of the suggested answers you want to give for a question, blacken the corresponding space on the answer sheet.

Example:	Sample Answer
Chicago is a	A ▭
(A) state	B ▬
(B) city	C ▭
(C) country	D ▭
(D) continent	

Give only one answer to each question; no credit will be given for multiple answers. If you wish to change an answer, erase your first line completely and mark your new choice.

DO NOT OPEN THIS BOOK UNTIL YOU ARE TOLD TO DO SO.

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614003
Y95P2.5

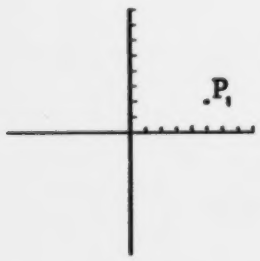
Directions: Each of the questions or incomplete statements below is followed by four suggested answers or completions. Select the one which is best in each case and blacken the corresponding space on the answer sheet.

79. As a course of study, the structure of geography can best be described as

(A) the basic facts of geography depicted on maps
(B) the history of geographic concepts
(C) spatial distributions and problems
(D) geographic concepts and their interconnections

80. Which of the following is NOT a geographic fact?

(A) Mt. Rainier, Washington is among the highest mountains in North America.
(B) The carrying power of a stream is proportional to its velocity.
(C) The Platte River in Western Nebraska now has a wide flood plain.
(D) The average length of the frost-free season in southern Texas is over 240 days.



81. The point P_1 may be written in which of the following ways?

(A) (2, 5)
(B) (−2, 5)
(C) (5, −2)
(D) (5, 2)

82. "The population of Petoskey, Michigan in 1960 was 6,138."

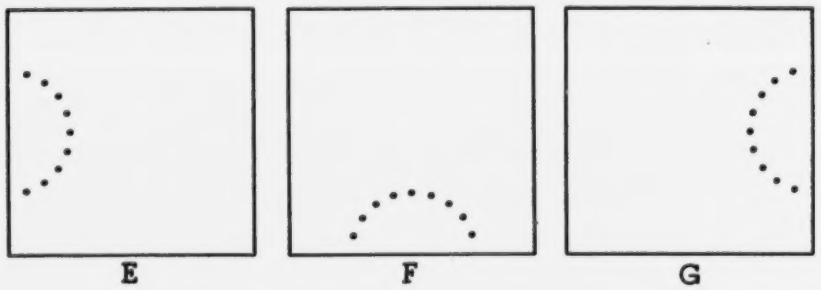
In the statement above, the word "population" designates a

(A) phenomenon
(B) location
(C) quantity
(D) quality

83. The X- and Y-axes of the Cartesian coordinate system intersect to form a

(A) geographic fact
(B) time-space relationship
(C) point of reference to indicate relative location
(D) spherical coordinate system

Questions 84-85 refer to the following diagrams.



84. In which of the following characteristics are E, F, and G alike?

I. Pattern
II. Density
III. Dispersion

(A) I only
(B) I and II only
(C) II and III only
(D) I, II, and III

85. Which of the following is indicated by the differences among E, F, and G ?

(A) Pattern, density, and dispersion are not the only characteristics of spatial distribution.
(B) Pattern and density are related.
(C) Spatial distributions are only hypothetical.
(D) Dispersion cannot be measured.

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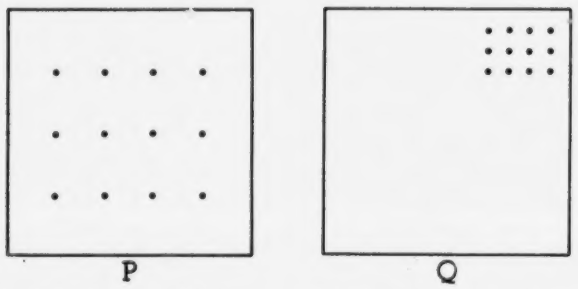
86. Distance in degrees measured north or south of the equator is called

(A) azimuth
(B) latitude
(C) longitude
(D) a meridian

GO ON TO THE NEXT PAGE.



87. In which of the following characteristics do P and Q differ?

I. Pattern
II. Density
III. Dispersion

(A) I only
(B) III only
(C) I and II only
(D) II and III only

88. To refer to a place as "Washington" is not geographically accurate because

(A) the site is fictitious
(B) it gives no indication of distance
(C) physical features are implied rather than stated
(D) location is only partially indicated

89. "Gallup is 135 miles west of Albuquerque."

The statement above is an example of which of the following kinds of specification of location?

(A) Relative
(B) Nominal
(C) Mathematical
(D) Polar

90. Which of the following is a quantitative rather than a qualitative statement about a phenomenon?

(A) The mountain rises high above the town.
(B) Alfalfa is a popular forage crop for cattle.
(C) There are 15,000 people in Bozeman, Montana.
(D) Iron ore is a heavier cargo than cotton.

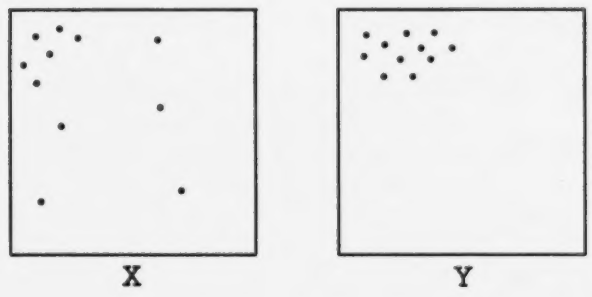
91. Which of the following is NOT a spatial distribution?

(A) Wheat farms in Montana
(B) The highest peak in the White Mountains
(C) The continents of the earth
(D) The state roads of California

92. Which of the following must be included in a statement of a geographic fact?

I. Place
II. Time
III. Phenomenon
IV. Quantity

(A) I only
(B) III only
(C) I, II, and III only
(D) I, II, III, and IV



93. In which of the following characteristics do X and Y differ?

I. Pattern
II. Density
III. Dispersion

(A) I only
(B) I and II only
(C) I and III only
(D) II and III only

94. Which of the following systems of location does the geographer most frequently employ?

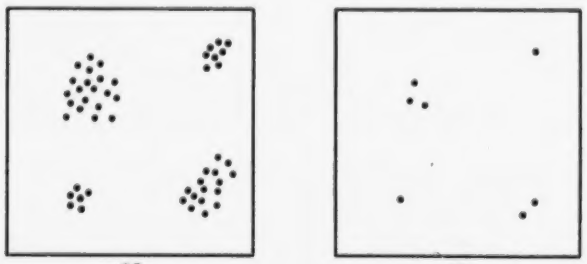
(A) Latitude-longitude
(B) Polar
(C) Cartesian
(D) Celestial

95. In the polar coordinate system, with north designated as 0^{o}, an angle of 90^{o} is equivalent to

(A) the origin
(B) east
(C) the X-axis
(D) P(4, 45)

GO ON TO THE NEXT PAGE.

Questions 96-97 refer to the following diagrams.



96. In which of the following characteristics are H and K alike?

I. Pattern
II. Density
III. Dispersion

(A) II only
(B) I and II only
(C) I and III only
(D) II and III only

97. If each dot in H represents two hundred television sets in a county and each dot in K one movie theater in the same county, which of the following statements are likely to be correct?

I. There may be a factor underlying the spatial distribution of television sets that also underlies the spatial distribution of theaters.
II. Theaters and television sets are similarly distributed in the county, but television sets are in greater quantity.
III. There are at least four towns in the county.
IV. The county is mountainous.

(A) I and III only
(B) II and IV only
(C) I, II, and III only
(D) II, III, and IV only

98. Which of the following represents Cartesian coordinates?

(A)

(B)

(C)

(D)

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.